

16. An audio and/or video data recording and reproducing apparatus according to claim 15, further comprising:

a plurality of audio and/or video data recording and reproducing apparatuses being connected in parallel, wherein said input data stream and said output data stream are input and output among said plurality of audio and/or video data recording and reproducing apparatuses.

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17. The audio and/or video data recording and reproducing apparatus of claim 11, wherein each one of said plurality of disk drives is configured to record a corresponding exactly one of said plurality of channels.

18. The audio and/or video data recording and reproduction method of claim 7, wherein said step of recording comprises:

recording the demultiplexed each one so that random access is possible, wherein each one of said plurality of channels is recorded on a corresponding exactly one of said plurality of recording means.--

In the Drawings

In FIG. 1, the reference character --3-- has been added. See the specification at page 9, line 1.

In FIG. 2, the reference character "1" has been underlined.

REMARKS

Claims 1-9 were pending in this application. Claims 1-9 have been amended. New claims 10-18 have been added to further claim applicant's invention. Thus, claims 1-18 are now pending. The specification has been amended to correct typographical and

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grammatical errors. As set forth in the attached LETTER TO OFFICIAL DRAFTSPERSON, the drawings have been amended to correct omissions. See the specification at page 9, line 1. It is respectfully submitted that such amendments are supported by the specification, claims, abstract of the disclosure and the drawings as originally filed, and that no new matter has been added.

Information Disclosure Statement

In the IDS submitted March 9, 1998 (the PTO-1449 of which was received with the latest Office Action), the Examiner neglected to note consideration of the Other Documents AD-AG. It is respectfully requested that the Examiner note consideration of these documents and forward an updated photocopy of the PTO-1449. If the Examiner is unable to locate the copies of such documents that were filed with the IDS, the Examiner is respectfully requested to contact applicant's undersigned attorney via telephone.

Claim Rejections under 35 U.S.C. § 102

The Examiner rejects claims 1-3 and 6-9 under 35 U.S.C. § 102(e) as being anticipated by Windrem et al., U.S. Patent No. 5,754,730 (hereinafter "Windrem").

Regarding claim 1, the Examiner states that Windrem discloses a digital video recording system employing standard hard disk arrays employing a cache management and disk utilization system to enable continuous video/audio data to be supplied to and provided from standard disk drives, comprising: (a) the claimed receiving means for receiving a data stream in which a plurality of audio data and video data or one of the same are multiplexed in a predetermined order (see input/output 19 for audio/video data channels; and col. 2, lines 12-27); (b) the claimed

multiplexing/demultiplexing means (see cache 14 which contains DMA controllers; col. 2, lines 51-65; and col. 5, lines 10-17); and (c) the claimed plurality of recording means (see disk array 12; and col. 2, lines 19-27).

In response, claim 1 has been amended to recite "wherein one of said plurality of recording means is configured to record exactly one of said plurality of channels". See FIG. 7; and the specification at page 34, line 10 through page 35, line 9. It is respectfully submitted that Windrem fails to teach, indicate, or suggest this feature.

Windrem, as understood, teaches that data is spread across the plurality of drives. See col. 2, lines 28-30. Data is organized in series on the plurality of drives. See col. 3, lines 31-35. Windrem fails to disclose any relationship between the data and the drive on which the data is written. Thus, Windrem fails to teach that one channel is recorded on one disk, as recited in amended claim 1.

Windrem, as understood, recognizes that disk latency is a problem in video applications. See col. 1, lines 19-31. Windrem teaches that increasing the number of disks increases the bandwidth. See col. 2, lines 28-30. Windrem then teaches a cache management system to improve disk latency. See col. 1, lines 47-59.

In contrast, in the present invention, as recited in amended claim 1, data of one channel is recorded on one disk. Thus, when one channel is recorded or reproduced, only one disk device performs the seek and rotation waiting, improving the seek time and the rotation waiting time. See the specification at page 37, line 25 through page 38, line 8. Windrem, as understood, fails to recognize this. Therefore, it is respectfully submitted that Windrem fails to suggest applicant's invention as now set forth in amended claim 1.

Thus, it is respectfully submitted that amended claim 1 is allowable over Windrem.

Regarding claim 2, the Examiner states that Windrem discloses wherein each of the plurality of recording means adopts a mirror configuration having a plurality of recording apparatuses for recording the same audio and/or video data (see col. 3, lines 22-30).

In response, it is respectfully submitted that claim 2 is allowable as a claim dependent from amended claim 1, as argued above.

Regarding claim 3, the Examiner states that Windrem discloses wherein each of said plurality of recording means adopts an array configuration in which a plurality of recording apparatuses are connected in parallel (see disk array 12; and col. 3, lines 31-52).

In response, it is respectfully submitted that claim 3 is allowable as a claim dependent from amended claim 1, as argued above.

Regarding claim 6, the Examiner states that Windrem discloses wherein the plurality of audio and/or video data recording and reproducing apparatuses are connected in parallel, and the data stream is input and output among these plurality of audio and/or video data recording and reproducing apparatus (see Fig. 1, disk array 12; and col. 3, lines 31-52).

In response, the rejection is respectfully traversed. Claim 6 is dependent from claim 5, which the Examiner has rejected under 35 U.S.C. § 103. It is respectfully submitted that dependent claim 6 cannot be rejected under § 102.

Regarding claim 7, the Examiner states that the limitations of claim 7 are accommodated in the discussion of claim 1 above.

In response, claim 7 has been amended in a manner similar to that of claim 1. Thus, it is respectfully submitted that amended

claim 7 is allowable for the same reasons as given above regarding claim 1.

Regarding claim 8, the Examiner states that Windrem discloses wherein each of the demultiplexed plurality of audio and/or video data is recorded on a plurality of recording media to perform backup for them (see redundant data controller 99; and col. 2, lines 28-40).

In response, it is respectfully submitted that claim 8 is allowable as a claim dependent from amended claim 7, as argued above.

Regarding claim 9, the Examiner states that the claimed limitations are accommodated in the discussion of claim 3 above.

In response, it is respectfully submitted that claim 9 is allowable as a claim dependent from amended claim 7, as argued above.

Claim Rejections under 35 U.S.C. § 103

The Examiner rejects claims 4-5 under 35 U.S.C. § 103 as being unpatentable over Windrem in view of Nakayama et al., U.S. Patent No. 4,947,271 (hereinafter "Nakayama").

Regarding claim 4, the Examiner states that Windrem fails to explicitly disclose wherein control data is multiplexed on the data stream, the demultiplexing means demultiplexes the control data multiplexed on the data stream, and provision is made for controlling a recording operation of the recording means and reproduction operation of the reproducing means based on the demultiplexed control data. The Examiner further states that Nakayama teaches in Fig. 7 a recording/reproducing means that in the recording process multiplexes recorded data signals to which ID data (control data) have been added. The Examiner further states that in the

reproduction process, these multiplexed data signals are later reproduced, demultiplexed and the ID data extracted (see col. 7, line 34 to col. 10, line 19). The Examiner further states that it is desirable to record data signals with their respectable [sic] control data (e.g., ID data), and then multiplex the data signals with the control data in order to facilitate the recovery of the data signals during the reproduction process when the data signals are demultiplexed. The Examiner further states to make these processes efficient there is inherently a control means that controls, based on the control data the recording/reproduction of the data signals. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Windrem by realizing Windrem with a means [to] add control data to data signals during the recording process before multiplexing, as taught by Nakayama, in order to facilitate the recovery of the data signal, during the reproduction process when the data signals are reproduced and demultiplexed. The Examiner further concludes that it would have been obvious to realize Windrem with a control means in order to make these controlled recording/reproduction processes efficient.

In response, it is respectfully submitted that claim 4 is allowable as a claim dependent from amended claim 1, as argued above. Furthermore, it is respectfully submitted that Nakayama fails to teach, indicate, or suggest that one channel is recorded on one disk, as recited in amended claim 1.

Regarding claim 5, the Examiner states that Nakayama teaches wherein at least one of the plurality of recording means and the plurality of reproducing means performs operation in synchronization with a synchronization signal of the data stream (see Fig. 6; and col. 3, lines 8-37).

In response, it is respectfully submitted that claim 4 is allowable as a claim dependent from amended claim 1, as argued above.

New Claims

New claims 10-18 have been added to further claim applicant's invention.

Support for claim 10 can be found in FIG. 7; and the specification at page 34, line 10 through page 35, line 9. It is respectfully submitted that claim 10 is allowable as a claim dependent from amended claim 1, as argued above.

Regarding claim 11, support for the input circuit can be found in element 626 of FIG. 8 of the drawings; and in the specification at page 27, line 22 through page 28, line 8. Support for the data controller circuit can be found in element 538 of FIG. 8 of the drawings; and in the specification at page 30, line 18 through page 31, line 2. Support for the disk drives can be found in element 520 of FIG. 8 of the drawings; in the specification at page 27, lines 5-12; and at page 29, line 21 through page 30, line 3. Support for the multiplexer circuit can be found in element 528 of FIG. 8 of the drawings; and in the specification at page 31, line 25 through page 32, line 11. It is respectfully submitted that claim 11 is allowable for the same reasons given above regarding amended claim 1.

Regarding claims 12-13 and 15-16, it is respectfully submitted that these claims are allowable for the same reasons given above regarding claims 2-3 and 5-6, respectively, as argued above.

Regarding claim 14, support for the control circuit can be found in element 530 of FIG. 8 of the drawings; and in the specification at page 31, lines 14-24.

Regarding claims 17-18, it is respectfully submitted that these claims are allowable for the same reasons given above regarding claims 10 and 7, respectively, as argued above.

Conclusion

In view of the above, it is respectfully submitted that the application is now in condition for allowance. The Examiner's reconsideration and further examination are respectfully requested.

Respectfully submitted,
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